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ABSTRACT

The place and importance of implementation in the life cycle of Army training programs is frequently misunderstood. Typically, a program's life cycle is thought of as research, development, and use. If implementation is thought of at all, it is regarded as an event, not a process. Many worthwhile programs have failed because the implementation process was neglected. Implementation should be regarded as a high-risk period in a program's life cycle. The implementation stage must be viewed as an organizational research and development stage in which the user decides where a program fits into the organization's priorities and the developer and user work together to plot a mutual accommodation of the program to the organization and the organization to the program. Planning for implementation of a training program involves deciding what actions are required to field, sustain, and support the program; what agencies should have responsibility for these actions; and how the cooperation of these agencies can be obtained. The analysis-of-fit model that has been developed to facilitate the accommodation process calls for fidelity and sufficiency evaluations to discover changes that are required in the following aspects of training program implementation: organizational arrangements, individual know-how, organizational rules, and individual commitment. The second phase of the model includes the following strategies for accomplishing the program's prerequisite goals: assistance, education, power, and persuasion. (MN)

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Research Report 1382

Implementing Army Training Programs: An Overview for Managers

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Research Institute for the Behavioral and Social Sciences

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An overview of implementation issues is presented. Implementation is viewed as an "organizational research & development" stage. In this stage the user decides where a new program fits into the organization's priorities. The developer and user then work together to plot a "mutual accommodation" of the program to the organization and the organization to the program. This report is intended for developers and users of Army training programs. The intent is to identify the issues involved in implementation. The ultimate goal is to increase the effectiveness of training programs for a better trained Army.

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Research Report 1382

Implementing Army Training Programs: An Overview for Managers

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FOREWORD

"To make the future happen sooner" it is not enough to develop or buy state-of-the-art training programs. These programs have to be aggressively integrated into the users' training environment.

As the Army's major behavioral science research and development agency, ARI has been involved in a number of programs that looked good to the researchers and developers (for example, Training and Doctrine Command (TRADOC), Development and Readiness Command (DARCOM), U.S. Army Forces Command (FORSCOM), U.S Army Europe (USAREUR)) but were simply not used by their target audience (for example, active Army units or TRADOC schools). This failure to transfer technology is distressing, and recently ARI has launched an important effort to find out why some well-designed programs succeed while equally promising ones fail.

Much of our research points to implementation as a key but neglected stage in a program's life cycle. This report provides an overview of implementation issues. Its main thesis is that users, developers, and researchers all have a stake in implementation, all have a unique role to play, and all can gain from a better understanding of the issues that implementation raises. The stakes are high. More attention paid to the process of implementation will result in the more effective use of training programs and increased readiness.

Edgar M. Johnson

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PREFACE

While there is a recognized need for new and better ways to train soldiers to fight, many training programs developed in response to this need are used poorly or not at all. Many of these programs fail to be implemented while others are so changed by the user that the program as used bears only a nominal relationship to the program that was fielded. To begin solving implementation and use problems, these problems must be viewed in the context of the program's life cycle. In this paper, the life of a training program is divided into three major sets of issues: research and development, implementation, and use.

It is argued that implementation is a distinct stage in a program's life cycle which involves "organizational research & development." During this stage both the developer and user have distinct, but mutually supportive, responsibilities. The user must decide (with developer input) where the program fits into the organization's priorities and how many resources can be devoted to it. The developer must decide how to make changes and compromises in the program so that its maximum value can be achieved with the resources available.

IMPLEMENTING ARMY TRAINING PROGRAMS: AN OVERVIEW FOR MANAGERS

EXECUTIVE SUMMARY

Requirement:

The place and importance of implementation in the life cycle of Army training progrms is not understood. Typically, a program's life cycle is thought of as research, development, and use: if implementation is thought of at all, it is regarded as an event, not a process. Unfortunately, many worthwhile programs have failed because the implementation process was neglected.

Procedure:

The view adopted here is that implementation is a high-risk period in a program's life cycle. The cost of ignoring implementation is measured by wasted research and development dollars and missed opportunities to improve training. The benefit of planning and monitoring implementation is the more effective use of training programs and increased readiness.

Findings:

An overview of implementation issues is presented. Implementation is viewed as an "organizational research & development" stage. In this stage the user decides where a new program fits into the organization's priorities. The developer and user then work together to plot a "mutual accommodation" of the program to the organization and the organization to the program.

Utilization of Findings:

The Report is intended for developers and users of Army training programs (for example, TRADOC Program Managers, ARI Team Leaders, private contractors, Army schools, and operational units). The intent is to identify for Army developers and users the issues involved in implementation. The hope is that a better understanding of implementation will result in more time and attention paid to implementation. The ultimate goal is to increase the effectiveness of training programs for a better trained Army.

Readers already convinced of the value of implementation should refer to the following:

A Guide to Implementation of Training Products (ARI Technical Report 1350) for a "users guide" to planning an implementation; and

Implementation Monitoring: A Role for Evaluators in Helping Innovations Succeed (ARI Technical Report, in press), for a technical discussion of the issues and procedures involved in monitoring an ongoing implementation effort.

IMPLEMENTING ARMY TRAINING PROGRAMS:

AN OVERVIEW FOR MANAGERS

Army programs face many of the same problems as programs in education or industry. Programs developed in response to real needs fail to be implemented and most of those that are implemented are modified and used quite differently than intended by the program's developer.

The Army Research Institute has had a continuing interest in the implementation and use of Army training programs. We have recently developed a threefold approach to implementation.

- Initiate case studies of the problems which training programs face and must overcome if they are to be successfully implemented and used.
- Provide guidance which Army sponsors can use to plan the implementation of new training programs (T. Gray, Roberts-Gray, & W. Gray, 1983).
- Develop a framework for monitoring and evaluating the implementation of training programs (W. Gray, 1984). Such a framework starts with the process of implementation and continues, ideally, until the program either fails or, if successful, becomes obsolete.

In this paper I present an overview of important implementation issues. The intended audience is those managers who are either about to hand-off a new program (researchers or developers) or about to implement one in their unit. Those desiring a more technical discussion of implementation are referred to W. Gray, 1984.

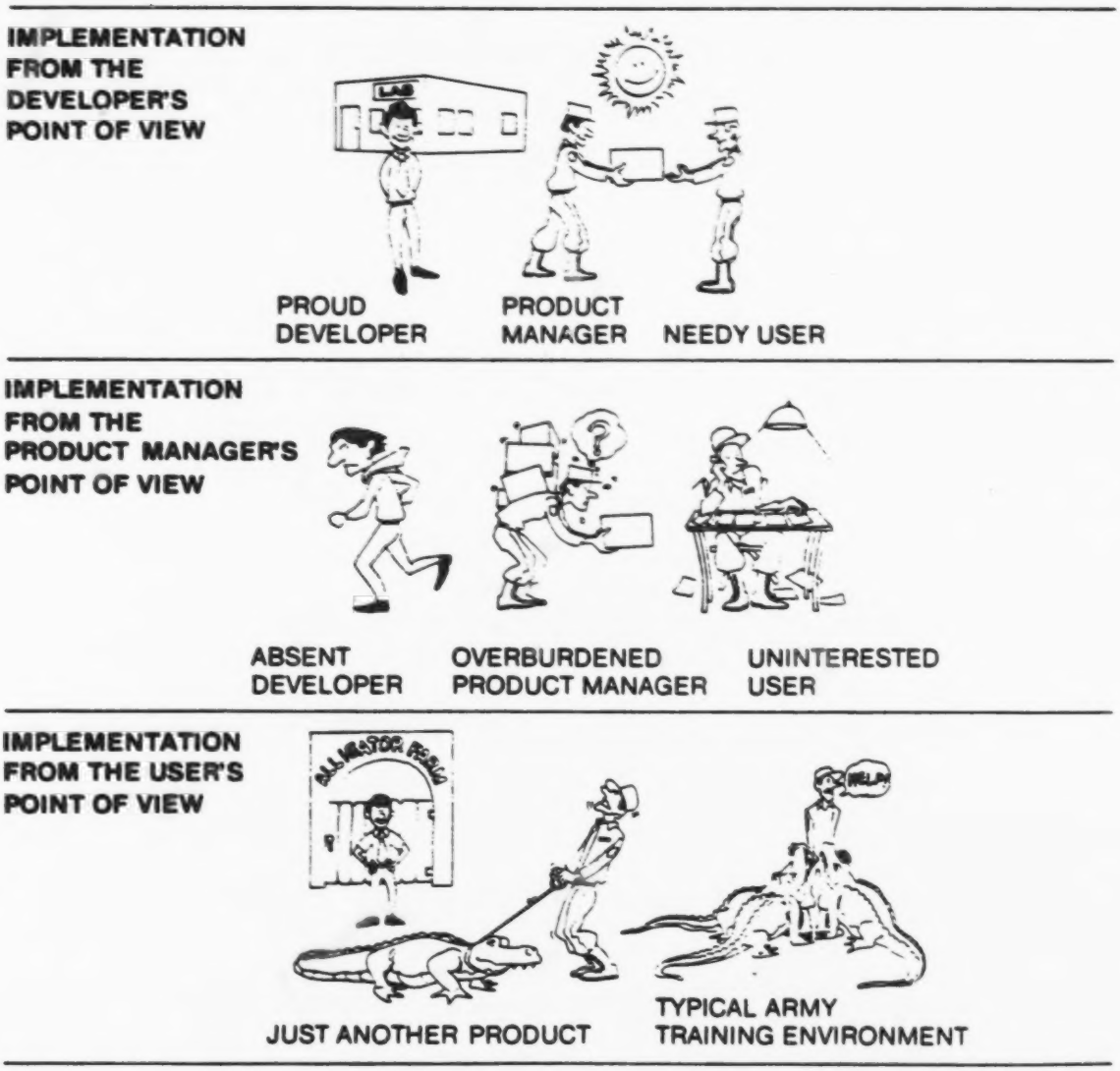

FIGURE 1: **Points of View on New Training Programs**

(Reprinted from ARI Technical Report 1350, September 1983)

Better Mousetrap or Alligator Farm? Obstacles to Implementation

The basic problem with the implementation process is the lack of an implementor, that is, neither the developer nor the user is willing to invest the time and energy required to properly implement a new program into the user's organization. (See figure 1.) The developer has a BETTER MOUSETRAP which he or she expects to be greeted with a round of applause from eager users. Unfortunately, the intended users are already busy doing other things and are likely to perceive the program more as an alligator than as a golden opportunity.

Identify Crisis or the Name is Familiar But I can't Place the Face

If a training program survives implementation and is used routinely, maximum return on the investment is still not assured. The problem with use is that the program as used is seldom, and maybe never, identical to the program that was developed. If the only information on the effectiveness of a program comes from the research and development stage, then very little is known about the effectiveness of the program as used by an organization.

Changes in the program by the user are a fact of life. For example, a Rand project that looked at the implementation of 293 educational projects found NO cases in which the project was implemented unchanged (Berman, 1978). All 293 projects were either not implemented at all, or if implemented, had been changed by the user.

At this point, I hope you (the reader) are beginning to be convinced of two things. First, new training programs do not just get used. They must be integrated aggressively into the user organization (W. Gray, 1982). Second, an implemented program is always different from the program the training developer produced.

Organizational Research & Development

In what follows, implementation is treated as an "organizational research and development" process. This view contrasts with the notion that implementation consists of the developer handing off a finished product which the user simply plugs in to solve a problem.

In organizational R & D the basic question for the user is -- how important is the new program? Where does it fit into my hierarchy of organizational needs and goals? (The developer, through years of narrow focus, often regards his/her newest program as solving the most important of the Army's problems. On the positive side, this attitude leads to hard work and high quality products. On the negative side, it can result in programs which require more resources than the user can provide or that the problem objectively deserves.) After the program's importance is decided, organizational R & D becomes a process of mutual accomodation of the program to the unit and the unit to the program. The goal is to maximize program effectiveness within the constraints (resources, time, effort, other priorities, and so on) provided.

Factors Affecting the Implementation & Use of New Training Programs

The problems which arise during the implementation and initial use of new training programs can be handled (if not always anticipated) by proper planning and careful monitoring. Implementation is best viewed as a dynamic process not a fixed event. Problems vary as a function of where the program is in its life cycle. Some problems arise, and are best solved, before the program becomes well established. Other problems emerge only after the program has been used for some period of

time. To best understand what problems occur when, an understanding of the program's life cycle (from an implementation perspective) is required (see figure 2).

Research & Development Issues

Figure 2 shows four classes of R&D issues which influence implementation and use. First is the condition analysis. This may be a broad look at all of Army training or narrower look at some area that is thought to be a problem. Out of the condition analysis comes a problem statement. As an example, the Army in the early 70's concluded that small-unit tactical training was in need of improvement. At this point, the training research community was called upon to develop a solution concept. To improve small-unit tactical training, a two-part solution was sought. One, develop a new team training methodology; two, develop a weapons and casualty effects simulator. This two-part concept was turned over to the developers for solution development. The developed solution was then measured against the concept in the Army's development test/operational test (DT/OT) cycle.

For most training programs, involvement of the R&D community ends at this point and the program is turned over to the user to do with as s/he pleases. However, there are important reasons for the developer to actively help implement the program and evaluate its use. As shown in figure 2 (by the line from "Effectiveness Evaluation" to "Problem Statement"), the real test of the developer's product is in its use in the field: Does use of the new program solve the training problem? For the state of field training to be a valid measure of a program's effectiveness requires that the program be implemented with an "acceptable" level of fidelity. Hence the developer has a vested

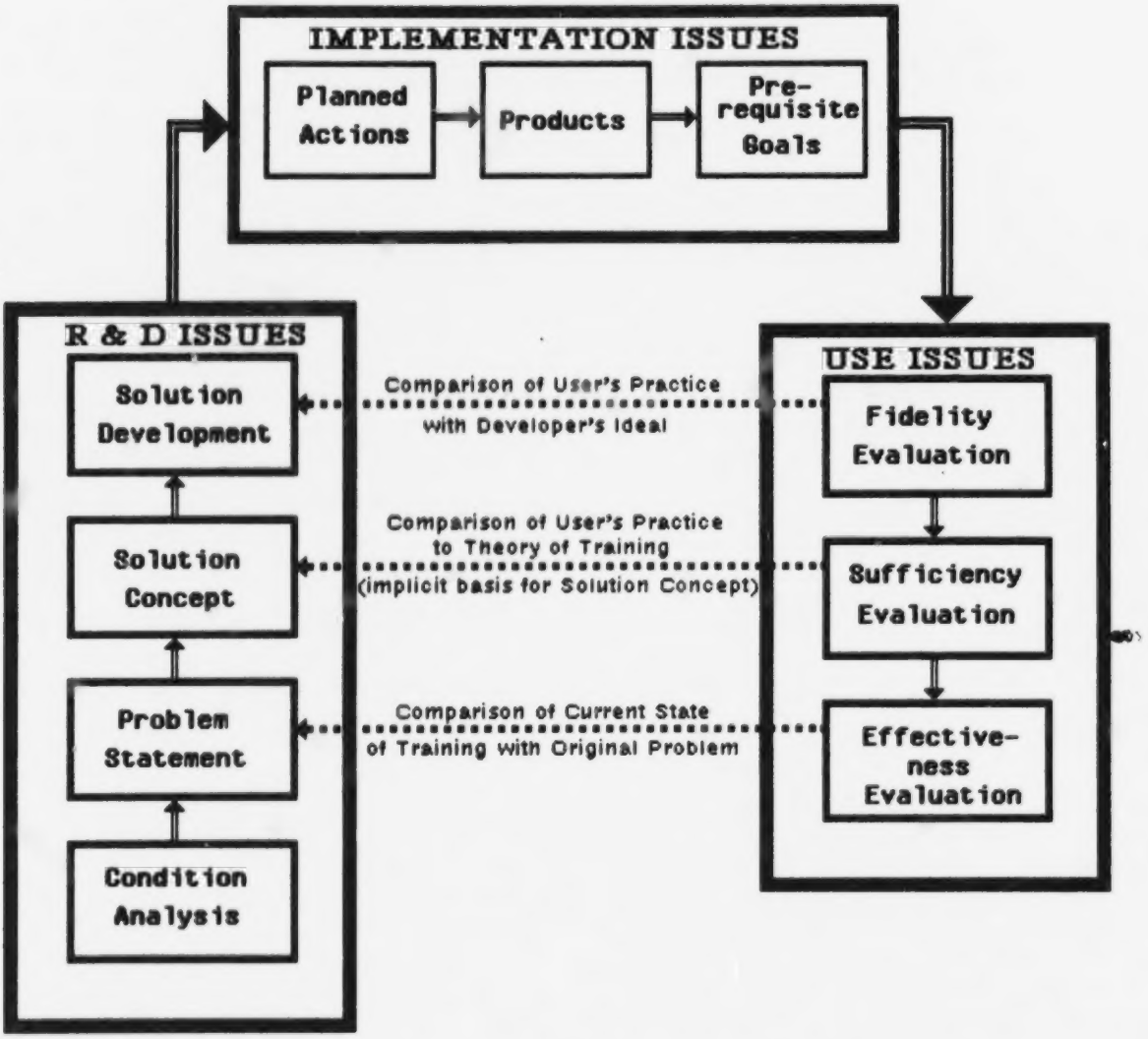

FIGURE 2: The Training Program Life Cycle from an Implementation Perspective

interest in working with the user to ensure that implementation problems are identified and overcome.

(REALTRAIN is an excellent example (see Scott, 1983). Controlled studies showed dramatic improvements in tactical proficiency among REALTRAIN trained troops (for example, Bank, Hardy, Scott, Kress, & Word, 1977), yet implementation problems were never resolved. Despite a worldwide fielding effort by the developer, REALTRAIN never obtained wide-spread use and quickly died a quiet death (Roberts-Gray, Clovis, T.Gray, Muller, & Cunningham, 1981).)

Implementation Issues

Implementation issues are those plans and actions required to aggressively integrate the new program into the operational environment. Planning an implementation involves deciding: (a) what actions are required to field and to sustain and support the program; (b) what agencies should have responsibility for these actions; and (c) obtaining the cooperation of these agencies.

Figure 2 depicts the three issues which should be monitored during implementation. An implementation plan can be considered as a set of "planned actions". The manager should determine whether the plan contains all actions necessary for implementing the program and any that are unnecessary. When a planned action is executed then a product of that plan exists. The manager should know whether the product achieved the goals planned for it or whether something was lost during the execution. For example, many Army training programs require new equipment and require that the trainer be able to perform some low level maintenance on the equipment. A "planned action" might be the production of a pamphlet for the trainer on how to troubleshoot the

equipment. The particular pamphlet that is produced is a product of this planned action. We can then ask whether this pamphlet provides all the information needed to troubleshoot the equipment and whether the reading level and format is appropriate for its intended audience.

The important point here is that both plans and products have to be good if the new program is to be successful. Too often plans are carefully made but during their execution a checklist mentality prevails. That is, at execution, product quality is not measured, plan accomplishment is. The result is that any product, no matter how poorly done, enables a planned action to be checked off as accomplished.

The ultimate goal of implementation plans is to get the new program used routinely. However, evaluation of routine use typically takes place after most implementation activity has ceased. Therefore, if we want to monitor "likelihood" of routine use we have to assess whether the implementation process is achieving certain pre-requisite goals.

The idea of pre-requisite goals must be elaborated even in an overview paper. For a training program, such as MILES (multiple integrated laser engagement simulation) to be successful, certain pre-requisite goals must be met. For example, MILES trainers (NCOs) must be able to diagnose and troubleshoot certain equipment malfunctions. Teaching trainers how to troubleshoot MILES equipment is a pre-requisite goal of the implementation program. As another example, for any new program to be used, a certain amount of organizational inertia (and resistance) must be overcome. Some of the implementation plans must be directed at overcoming this inertia. (In the example of MILES, this inertia was overcome through a combination of command emphasis, new rules and regulations regarding tactical training, and demonstrations

which emphasized MILES' realism.)

The Place of Theory. An adequate theory of implementation would serve to identify certain classes of potential problems and suggest strategies for overcoming these problems. ARI has sponsored the development of a model which works for most Army training programs (Roberts-Gray & T.Gray, 1983). The model (see Figure 3) provides a basis for analyzing the fit between the innovation and user. With this information, the model yields an analysis of changes in organizational arrangements, individual know-how, organization rules, and individual commitment that are required if the innovation is to "fit" the user. These changes become the pre-requisite goals of the implementation process. Finally, for each change, the model yields a suggested strategy for accomplishing that change.

Use Issues

As mentioned earlier, the program as used is seldom identical to the program that was developed. Hence, it is necessary to describe the program that is actually used and to assess its actual, as opposed to theoretical, effectiveness. From an implementation perspective, these concerns can be organized into the categories of fidelity, sufficiency, and effectiveness (see Figure 2). Each category of use issues is related to a category of R&D issues as well as being interrelated with the other use issues.

Fidelity. Fidelity evaluation (Fullan & Pomfret, 1977) is procedure oriented. It is a comparison of the user's procedures against the developer's ideal. The goals of the fidelity evaluation are to determine what parts of the program are actually used and to describe variations in use among different users. The data from the fidelity

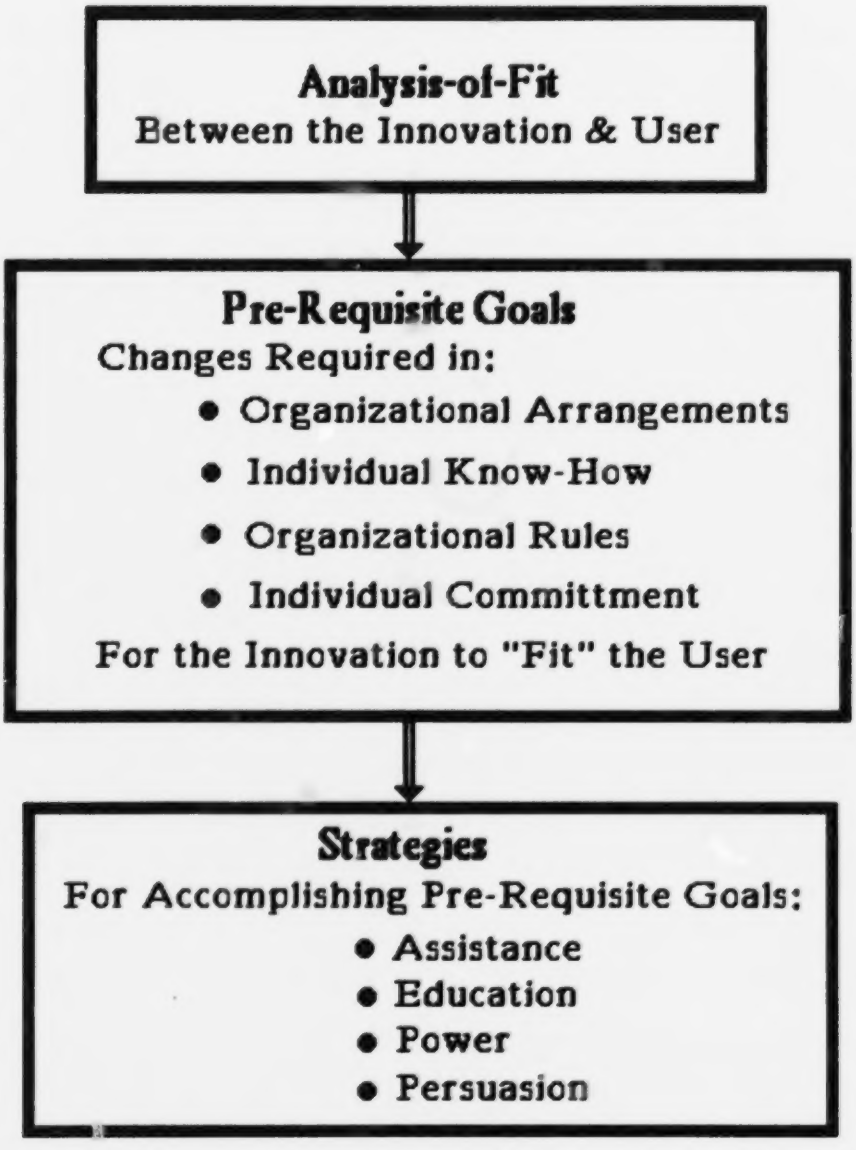

FIGURE 3: A Model of Implementation

evaluation provides feedback to the developers on how well their product is used and feedback to the implementors on the implementation process. Results of the fidelity evaluation may lead implementors to launch a second, revised effort at implementation.

Sufficiency. The sufficiency evaluation is function oriented. It compares a user's practice against an ideal model of "how-to-train." (The area of sufficiency evaluation has been referred to by Leinhart (1980) as Domain-of-Instruction.) We assume that in the solution concept stage of R&D, the researchers had an implicit theory of what functions the trainer must perform to conduct good training (such as that provided for teacher functions by Fisher, Berliner, Filby, Marliave, Cahen, & Dishaw (1981)). Each function was then instantiated during solution development to form the exact procedures which define the particular program. Since we know that users always change a program by dropping, adding, or altering procedures, it is more than possible that a function is being fulfilled by procedures different than those the developer provided. This situation is what sufficiency evaluation is designed to assess. For example, many training programs include procedures which function to provide feedback to the trainees. However, if the exact procedures specified by the program are not followed, feedback may still be provided by some other procedures. Hence, we could find the case where excellent feedback is being provided but the procedures called out by the training program are not followed. That is, the function is being filled, but the procedures are not followed.

Sufficiency evaluation is important because it gets us away from the assumption that any change in the program is bad. If the users

change the program to bring it more in line with their way of doing things, then the users may have substituted procedures of their own which fill the same function as the procedures invented by the developer.

Effectiveness. The effectiveness evaluation should be (but usually is not) a "user oriented" comparison of the current state of training with the pre-fielding state of training. It is not an experiment. The purpose is not to assess the "maximum" effectiveness of the system, but to assess its actual effectiveness when used routinely by real users. The goal of this evaluation is to decide whether the problem which led to the development and fielding of the program has been solved.

Conclusions & Perspectives

Experience with Army training programs has led ARI to the belief that attention to the process of implementation is vital if a program is to become a routine part of unit training. ARI has developed guidance for implementation planners (T.Gray, Roberts-Gray, & W.Gray, 1983) and a framework for implementation monitoring (W.Gray, 1984). The framework is Army oriented. It organizes the monitoring issues in terms and categories attuned to the political realities and training issues with which the Army user is familiar.

Probably the biggest implementation problem is the lack of an implementor. The user is typically overburdened (see figure 1) with routine tasks and has no resources to spend assessing the impact a new program will have on his/her plans, procedures, resource requirements, and so on. The developer's mission is to develop and maybe deliver the new program. For the developer a delivered program is a dead issue for which s/he has neither the time nor resources to track.

Monitoring implementation can create organizational conflicts. Developer and user organizations are often jeolous of each other's authority. The fine line between evaluating the usability of a program and evaluating how a unit uses a program (that is, evaluating the program versus evaluating the unit) is hard to draw. Furthermore, both users and developers understand that in the real-world (as opposed to the R&D laboratory) failure tends to precede blame. If a program fails the reasons for that failure are better left unprobed rather than being attributed to a failure of usability or a failure of use.

The way out of this dilemma is to view implementation as a stage in the program's life cycle during which the developer and user have distinct but mutually supportive roles. For both the issue is how to get maximum training value from the program in the context of the user's training environment. For the developer the focus is on how to modify the program so that it better fits that environment. For the user the task is to modify the environment to best support the program (without sacrificing other equally or more important programs). The goal is to treat implementation as a stage during which "organizational research and development" is needed to best decide where the program fits in with the organization's priorities and, given the resources available, how it can be used to maximum advantage.

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